

IN THE CLAIMS:

The text of all pending claims, (including withdrawn claims) is set forth below. Cancelled and not entered claims are indicated with claim number and status only. The claims as listed below show added text with underlining and deleted text with ~~strikethrough~~. The status of each claim is indicated with one of (original), (currently amended), (cancelled), (withdrawn), (new), (previously presented), or (not entered).

1. (currently amended) A curve ~~production~~-system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and
a curve ~~generation~~-system producing and controlling and entirea smooth virtual tape curve using ~~by mapping the relative positions to positions of the virtual tape curve.~~
2. (original) A system as recited in claim 1, wherein tape shape is dynamically adjustable and curve shape corresponds to the tape shape.
3. (original) A system as recited in claim 2, wherein the curve is part of a surface and a shape of the surface corresponds to the curve shape.
4. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and
a curve generation system producing and controlling an entirea smooth tape curve using the relative positions fora positions of the tape curve, and
wherein a scene includes an anchor curve and the tape curve drags out a surface shape from the anchor curve responsive to movement of the flexible tape.
5. (original) A system as recited in claim 4, wherein the surface is created by interpolation between the anchor curve and the tape curve.
6. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing and controlling an entire a smooth virtual tape curve using~~by mapping~~ the relative positions for~~to~~ positions of the virtual tape curve, and wherein the virtual tape curve sets an object profile curve.

7. (original) A system as recited in claim 6, wherein the tape curve provides a path to drag out an object shape along the profile curve.

8. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and
a curve generation system producing and controlling an entirea smooth virtual tape curve using~~by mapping~~ the relative positions for~~to~~ positions of the virtual tape curve, and wherein the tape curve sets a path curve.

9. (original) A system as recited in claim 8, wherein the tape curve specifies a surface shape along the path curve.

10. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and
a curve generation system producing and controlling an entirea smooth virtual tape curve using~~by mapping~~ the relative positions for~~to~~ positions of the virtual tape curve, and wherein the flexible curve provides a profile and an object is created by revolving the profile curve in a scene.

11. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing and controlling an entire smooth virtual tape curve using ~~by mapping~~ the relative positions for ~~to~~ positions of the virtual tape curve, and wherein the tape curve is a spline curve and the relative tape positions are used as control points of the tape curve.

12. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;
a curve generation system producing and controlling an entire smooth tape curve using the relative positions for ~~as~~ positions of the tape curve; and
a world position sensor attached to the flexible tape and providing a three dimensional world position of the tape and said curve generation system positions the tape curve in a virtual scene in correspondence to the world position.

13. (original) A system as recited in claim 12, wherein said world position sensor senses three dimensional world orientation of said world sensor and said curve generation system positions the tape curve in a virtual scene in correspondence to the world orientation.

14. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;
a curve generation system producing and controlling an entire smooth tape curve using the relative positions for ~~as~~ positions of the tape curve; and
a command input device producing an input command and said curve generation system controls the tape curve responsive to the input command.

15. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;
a curve generation system producing and controlling an entire smooth tape curve using the relative positions for ~~as~~ positions of the tape curve; and

a command input device producing an input command and said curve generation system controls the tape curve responsive to the input command, and

wherein said command input device comprises one of a foot pedal, a foot mouse, buttons on a position locator and a portion of the flexible tape.

16. (currently amended) A system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape

a curve generation system producing and controlling an entire a smooth virtual tape curve ~~by mapping~~ using the relative positions ~~for~~ positions of the virtual tape curve; and
an animation system using the relative positions as a command.

17. (original) A system as recited in claim 16, wherein a shape of the input device flexible tape indicates a command.

18. (previously presented) A system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape; and

an animation system using the relative positions as a command, and

wherein an end portion of the flexible tape is used for input command gestures.

19. (previously presented) A system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape; and

an animation system using the relative positions as a command, and

wherein an end portion of the flexible tape is used for a cursor control command.

20. (previously presented) A system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape; and

an animation system using the relative positions as a command, and

wherein an end portion of the flexible tape is used for a selection control command.

21. (previously presented) A system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions to a reference position sensing element of the tape; and
an animation system using the relative positions as a command, and
wherein a system user drops curves in a scene responsive to tape curve position and the input command.

22. (original) A system, comprising
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape; and
editing system editing one of curves and surfaces responsive to the relative position.

23. (original) A system as recited in claim 22, wherein a virtual scene includes a scene curve and said curve generation system edits the scene curve responsive to the tape curve.

24. (previously presented) A system, comprising
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape; and
editing system editing one of curves and surfaces responsive to the relative position, and
wherein a scene includes a wire curve and the tape curve controls the wire curve.

25. (original) A system as recited in claim 24, wherein the flexible tape comprises twist sensors and the wire curve is twisted in correspondence to the tape curve responsive to twist of the flexible tape.

26. (previously presented) A system, comprising
a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape; and

editing system editing one of curves and surfaces responsive to the relative position,
and

wherein a scene includes a wire curve and a wire reference curve and the tape curve
controls the wire curve and the wire reference curve.

27. (previously presented) A system, comprising
a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape and producing relative tape positions relative to a
reference position sensing element of the tape; and

editing system editing one of curves and surfaces responsive to the relative position,
and

wherein a scene include a scene curve and the scene curve is snapped to a shape of
the tape curve.

28. (currently amended) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape, and producing relative tape positions relative to a
reference position sensing element of the tape; and

a curve generation system producing and controlling an entire a smooth tape curve using
the relative positions foras positions of the tape curve, and

wherein said curve generation system comprises a user controllable gain controlling
relative positions of the tape curve responsive the relative positions of the flexible tape.

29. (previously presented) A curve production system, comprising:
a flexible handheld tape device comprising a flexible tape having relative position
sensing elements spaced along the tape, and producing relative tape positions relative to a
reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as
positions of the tape curve, and

wherein said tape curve is displayed egocentrically to the user in a scene in which the
tape curve is interacting within changes in viewpoint.

30. (previously presented) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing a smooth tape curve using the relative positions as positions of the tape curve, and

wherein the flexible tape comprises a physical constraint comprising one of a substitutable mechanical stiffness member, a physical position lock and a shape retaining member.

31. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing and controlling an entire a smooth tape curve using the relative positions ~~for~~as positions of the tape curve, and

wherein the tape curve dynamically controls curves in a dynamic scene responsive to the flexible tape.

32. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing and controlling an entire a smooth virtual tape curve ~~using~~~~by mapping~~ the relative positions ~~for~~to positions of the virtual tape curve, and

wherein the flexible tape is conformed to a shape of a physical object and the virtual tape curve comprises an input of the shape.

33. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape; and

a curve generation system producing and controlling an entire a smooth tape curve using the relative positions ~~for~~as positions of the tape curve, and

wherein said device includes subsection specification sensors and said tape curve shape is responsive to subsection shape.

34. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a flexible tape having relative position sensing elements spaced along the tape, and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation system producing and controlling an entire smooth tape curve using the relative positions ~~for~~ positions of the tape curve;

a two-dimensional surface upon which said device rests and upon which surface a shape of said device is changed; and

a world position input device specifying a world position of the tape curve.

35. (currently amended) A curve production system, comprising:

a flexible handheld tape device comprising a dynamically shape adjustable flexible tape having relative position sensing elements spaced along the tape and producing relative tape positions relative to a reference position sensing element of the tape;

a curve generation and editing system producing and controlling an entire smooth spline tape curve using the relative positions as positions of the tape curve corresponding to the dynamically adjusted shape and producing a shape of a surface when the tape curve drags out a surface shape from an anchor curve responsive to movement of the flexible tape; and

a world position sensor attached to the flexible tape and providing a three dimensional world position and orientation of the tape and said curve generation system positioning the tape curve in a virtual scene in correspondence to the world position and orientation; and

with said tape device acting as command input device producing an input command and said curve generation system controlling and editing the tape curve responsive to the input command and a shape of the tape curve.

36. (currently amended) A curve production system, comprising:

a flexible tape device producing shape, twist and six degrees of freedom position information;

curve production means for producing and controlling an entire smooth virtual tape curve by using mapping the shape, twist and six degrees of freedom information ~~for~~ positions of the virtual tape curve; and

display means for displaying a the virtual tape curve having a shape, a twist and a position corresponding to the shape, twist and six degrees of freedom position information.

37. (currently amended) A curve production method, comprising:
adjusting a shape of a flexible tape; and
producing and controlling an entirea virtual curve using the flexible tape as control points
of a non-uniform rational B-spline curve.

38. (currently amended) A computer readable storage controlling a computer and
comprising a process of inputting a shape of a flexible tape and producing and controlling and
entire a non-uniform rational B-spline curve responsive to the shape.

39. (currently amended) A graphical user interface comprising a virtual non-uniform
rational B-spline tape curve entirely manipulable in a scene responsive to a physical flexible
tape.

40. (currently amended) A curve production method, comprising:
adjusting a shape of a flexible tape with two hands; and
producing and controlling an entirea virtual curve using the flexible tape.

41. (currently amended) A curve production method, comprising:
adjusting a shape of a flexible tape having position sensors producing relative tape
positions;
producing and controlling with mappingthe relative tape positions an entirea virtual
curve using the flexible tape; and
displaying the virtual curve.

42. (new) A curve production method, comprising:
allowing a user to adjust a shape of a flexible tape having position sensors producing
relative tape positions;
producing all the points of a virtual curve using the relative tape positions; and
displaying the virtual curve.